



Questions and Answers for Fuel Leak Public Meeting

Q. What is the timeline of events for the Kirtland Air Force Base fuel leak?

A. In 1999, the Air Force completed an investigation of the subsurface soils and the groundwater beneath the offloading rack to determine the extent of the fuel contamination after learning of a leaking pipe in Kirtland AFB Bulk Fuels Facility. The results from the investigation showed no fuel product on the water table, only minor dissolved phase contamination in the groundwater. Based on those results, we believed the fuel contamination was limited to the subsurface soils and groundwater within close proximity to the fuel offloading rack.

Remedial efforts to remove fuel contamination from the subsurface soil and groundwater began immediately and the issue and remedial efforts were briefed at numerous Kirtland AFB Environmental Assessment Semi-Annual Public Meetings between 2000 and the present. In late 2006, after evaluating on-going remediation efforts since 2003, it was determined that the results of the remediation did not demonstrate the anticipated rate of cleanup of the subsurface soil and groundwater; a secondary source of contamination not discovered during the initial investigation was suspected to exist.

Based on the evaluation, Kirtland AFB requested the approval from the state regulatory agency to install an additional monitoring point to investigate the possibility of a secondary source. In early 2007, the well was installed and the fuel product discovered on the groundwater. Kirtland AFB notified the state regulatory agency and submitted a plan to investigate and remediate the fuel product. Kirtland AFB then requested emergency out-of-cycle funding (\$500,000) to investigate the extent of the fuel product.

In late 2007, additional monitoring points were installed to determine the extent of the fuel product. The investigation discovered fuel product on Kirtland AFB, extending off base underneath property owned by the City of Albuquerque. Kirtland AFB continued monitoring base and the Raymond G. Murphy Veterans Affairs Medical Center water production wells and to date, no contamination has been detected. Because the fuel product plume extends off base and the extent of the fuel product has not been determined, it has now become necessary to conduct further investigation, both on and off base.

Q. How did the aviation and jet fuel make it into the subsurface soils?

A. The release of aviation and jet fuel was caused by a failure of the fuel distribution infrastructure. One of the pipes corroded, creating holes where the fuel was released into the subsurface soil. That system was removed from operation in 1999 and a temporary system installed; a new system is currently being planned. Additionally, all of the fuel lines currently in use at the fuels facility have been tested for leaks and none were discovered.

Q. What is the current status of the underground fuel pipes at Kirtland AFB?

A. The fuel system infrastructure at the Bulk Fuels Facility is tested for leaks on an annual basis. The most recent tests were conducted in 2007, and no leaks were discovered. Annual leak tests are scheduled again for September 2008.

Q. Why did Kirtland AFB hold a public meeting in July 2008?

A. The Air Force has received necessary funding (\$2.8 million) and a contract has been awarded to continue our remediation and investigative efforts. A work plan for conducting the investigation has been submitted to the state regulatory agency and approved. The off base remediation and investigation, on lands outside of Kirtland AFB, may require drilling and installation of groundwater monitor points in Albuquerque, the VA and within neighborhood areas. The reason we held a public meeting is because we want those neighborhoods to understand what we're doing and why we're doing it. We believe all parties involved should be as informed as possible while the Air Force takes the next steps in remediation efforts. We will continue to use a combination of public meetings, postings on the Kirtland AFB Web site and media releases to keep the public informed.

Q. Why did it take so long to discover the fuel in the groundwater?

A. Initial investigations of the groundwater beneath the release from the corroded piping showed no fuel product on the groundwater. Kirtland AFB then installed additional groundwater monitoring points to assess potential impacts to the base and VA Hospital water production wells and verified there had been no impacts to those wells.

At that point, efforts focused on beginning remediation of the soil above the water table that had been impacted by the primary releases from the corroded piping. As remediation of that area progressed, ongoing data evaluation indicated that a second area of contamination might be present in the subsurface soil.

To investigate this possibility, Kirtland AFB installed an additional groundwater monitoring point in 2007 about 1,000 feet from the original site where the fuel product was detected. That well was the first location in which fuel was detected on the groundwater surface. Data suggests that the fuel moved laterally in the unsaturated soils beneath the point of release along layers of clay to a point where the fuel could flow downward to the groundwater. This is why the fuel is not present immediately below the original release point.

Q. Which Albuquerque neighborhoods could be affected by the contaminated groundwater?

A. Neighborhoods in the southeast section of Albuquerque located above the area in the direction that the groundwater contamination has been moving. Groundwater monitoring points funded by the Air Force will be installed starting in August 2008 to determine the extent of contamination off base and how far the contamination has migrated. Kirtland AFB is committed to taking responsibility, installing a remediation system and continuing to investigate the extent of the fuel contamination.

Q. Could water production wells be affected by the contaminated groundwater?

A. Yes, two water production wells on Kirtland AFB, the Veterans Affairs well, and the Albuquerque Bernalillo County Water Utility Authority Ridgecrest water production well field could potentially be affected. To date, the Kirtland AFB and VA wells have been tested and are not affected. The information that the contamination had been discovered approximately 1.6 miles from the nearest Ridgecrest well was provided to the Albuquerque Bernalillo County Water Utility Authority. The water authority provided recent and historical water quality data for the Ridgecrest well field and no fuel contamination has been detected in those city wells. Kirtland AFB tests the two Kirtland AFB wells and the VA well once a quarter and the water authority tests one well on the Ridgecrest water production well field once a quarter and tests the rest annually.

Q. Where are the city wells located in relation to the fuel leak?

A. The closest down gradient production wells in the Ridgecrest well field are approximately 1.6 miles down gradient and to the northeast of the furthest known extent of the fuel product.

Q. Is the water we drink and shower with contaminated with petroleum hydrocarbon fuel?

A. No. Based on recent and historical analytical results, Kirtland AFB personnel and the water authority have determined that the water used by members of Kirtland AFB, the VA Medical Center and the water from the Ridgecrest well field have **not** been contaminated by the fuel discovered on the groundwater.

Q. What would happen if contamination was found in the drinking water?

A. The water quality of the Kirtland AFB, City of Albuquerque, and the VA Medical Center water production wells are monitored on a quarterly or annual basis. As a result, if contamination was discovered in the water, the water well would be taken out of production to avoid the contaminated water from reaching the public. Further, as a result of the discovery of the fuel on the groundwater, the frequency of the water quality monitoring has increased from annual to quarterly testing to avoid production of contaminated groundwater.

Q. Could the contamination spread further than it already has outside of Kirtland AFB? If yes, what is Kirtland AFB doing to stop that from happening?

A. Yes. Installation of an interim remedial system was installed in August to begin fuel product removal and decrease migration of the fuel. Alternative systems may also be required in the future to stop the fuel migration.

Q. How does Kirtland AFB plan to remedy the situation? How will Kirtland AFB remove the contamination?

A. Kirtland AFB has already installed an interim remedial system that will initiate removal of the liquid fuel from the groundwater and burn the fuel at the surface. The interim remedial system has an internal combustion engine with a catalytic converter, just like a regular automobile engine, which ensures there are no air emission issues. Additionally, monitoring points will be installed within the plume to monitor the destruction of the fuel. The monitoring results will be assessed for additional remedial requirements such as additional or alternative remedial systems. The interim system recently installed is similar to a system already in place at the Kirtland AFB Bulk Fuels Facility that has destroyed 130,000 gallons of fuel vapors from the subsurface. The selected remedial system was evaluated and recommended by an Air Force agency. The Air Force considers this a high priority site and emergency out-of-cycle funding of \$500,000 was received last year, which was used to initiate investigation of the contamination and install an emergency product removal system. Additionally, Kirtland AFB received \$2.8 million for fiscal 2008 to complete the investigation, install the interim remedial system to initiate removal of the fuel from the groundwater, and install 11 ground water monitoring points on and off base to determine the extent of contamination.

Q. What percentage of fuel contamination will the remediation efforts eliminate?

A. The state regulations require that all of the fuel from the groundwater be remediated and fuels in the soil be remediated to the extent that the threat of further groundwater contamination is eliminated.

Q. What is the location of the second soil vapor extraction unit?

A. The soil vapor extraction system is located in the groundwater monitor well Kirtland AFB -1065 in which the fuel product was first discovered (see the map on the Kirtland AFB Web site "Fuel Leak" section at www.KirtlandAFB.af.mil). The SVE system is anticipated to remove approximately 250-300 gallons of fuel per day. Additional SVE systems will likely be required as the fuel plume is further defined, and will be located where it can be most effective.

Q. Does Kirtland AFB plan to use dual purpose wells that will allow monitoring as well as remediation and investigation?

A. The eleven groundwater monitor points will be constructed to be able to serve as both points of remediation and monitoring.

Q. How large do you expect the plume to get?

A. The extent of the plume is anticipated to be defined by approximately December 2008, upon completion of the current investigation.

Q. What is the estimate of fuel believed to be on the ground water?

A. Because the extent of the plume has not been defined, the known extent of the plume is only an estimate. Based on the estimated extent of the plume, the volume of the plume is approximately 2 million gallons.

Q. Is the plume still being fed fuel, causing it to grow larger?

A. When the original fuel leak was discovered in the offloading rack system in 1999, the system was taken out of operation. This stopped additional fuel from leaking into the subsurface. This in turn will stop additional fuel from migrating to the fuel plume on the groundwater.

Q. Is it possible to intercept the fuel plume and stop it from spreading? If so, how?

A. The soil vapor extraction system used for remediation of the fuel product will vaporize the surface of the fuel, reducing the mass and therefore slowing the migration of the fuel. However, the SVE system is not a barrier that will physically prevent fuel from migrating. The effectiveness of the SVE system at removing the fuel and slowing or stopping the migration will be monitored to determine if another technology is required to physically intercept and stop the migration of the fuel.

Q. Is the City of Albuquerque monitoring for jet fuel?

A. Yes. Based on information provided to Kirtland AFB by the water authority, the water is being analyzed for the individual constituents that would be found in jet fuel.

Q. How deep are the city and base production wells?

A. Kirtland AFB water production wells are as deep as 1,200 feet below the ground surface. Kirtland AFB understands that the wells in the Ridgecrest well field are roughly 1,200 to 1,500 feet deep.

Q. How far does the water and fuel travel in the aquifer each year?

A. Available information and an understanding of the regional aquifer based on the USGS's regional basin model, the horizontal flow in the regional aquifer as a whole in this part of Albuquerque may be up to approximately 100 feet per year. This rate of flow may not apply to the fuel, because the fuel is a separate liquid located on top of the water and not mixed with the water and will probably not travel as fast as the groundwater.

Q. How many levels of strata is the fuel going through as it travels northeast?

A. The fuel is located on top of the groundwater, which flows through sands, silts and clays that comprise the geology of the regional aquifer. The geology of the regional aquifer will vary along the path of the fuel and groundwater.

Q. What do you estimate to be the damage to the aquifer if the fuel reached the wells?

A. The fuel product detected to date is on the regional aquifer that provides water for Kirtland AFB and the water authority. The “damage” to the Kirtland AFB or water authority would occur if the fuel was detected in one of the respective water production wells. Kirtland AFB cannot provide information on behalf of the City of Albuquerque for how the city will react if contamination is detected in their production wells, but Kirtland AFB would remove a Kirtland AFB water production well from service, and assumes the water authority would also remove their well from service.

To date, no fuel contamination has been detected in either the Kirtland AFB or water authority water production wells. If detected, the fuel would be in the dissolved phase first and not the liquid phase. The liquid phase follows the dissolved phase on the groundwater. Therefore, once the dissolved phase was detected, action would be taken by Kirtland AFB and the water authority to protect the wells and drinking water prior to the fuel reaching concentrations that would cause health concerns. The wells would not be damaged, just unable to be used.

Q. Will the Air Force pay for all remediation efforts outside of the Kirtland AFB boundary?

A. Yes. The Air Force holds itself responsible for all remediation efforts.

Q. What level of detection is being used to measure the amount of dissolved phase product in the water?

A. Analyses have a range of detection levels dependent upon the fuel constituent being analyzed; however, compounds are all measured in units of milligrams per liter, which equates to parts per million, or micrograms per liter, which equates to parts per billion.

Q. To what depth below the float (change to groundwater surface) do the dissolved constituents exceed the maximum contaminant levels?

A. The depth of the dissolved constituents in the groundwater has not been determined. This will be conducted during the delineation of the plume scheduled to begin in August 2008.

Q. What is the estimated time table on when the dissolve phase will be defined?

A. The investigation proposed for FY08 is anticipated to delineate both the product and dissolved phase. The investigation is anticipated to be completed by approximately December 2008.

Q. Do you contract with in state or out of state labs to measure fuel content in the water?

A. Out of state laboratories are used to conduct the analyses of the water samples contaminated with the fuel. TestAmerica Laboratories in Denver, Colo., has and will continue to be used for these analyses. Also, PEL Laboratories in Tampa, Fla., will be used as well in the future.

Q. What is Kirtland AFB doing to monitor and remediate fuel vapors?

A. Kirtland AFB installed an additional soil vapor extraction system to begin further remediation of the fuel product on the groundwater and the associated fuel vapors. The second soil vapor extraction system is in addition to the existing system that has been operating at the site since 2003.

Q. If the jet fuel is lighter than water, is there a possibility that fuel could be transferred to the surface through rain fall, etc.?

A. The fuel produces vapors that do migrate up into the subsurface soils. Because the fuel is located at a depth of 500 feet below the ground surface, the vapors are not anticipated to reach the surface. Kirtland AFB is conducting a survey of the shallow subsurface soil on Kirtland AFB and at Bull Head Park to determine if the fuel vapors have migrated up into the surface soil. During drilling of monitor points into the fuel product, the soil vapors in the soil have been monitored from the surface to the depth of the fuel product/groundwater. No significant vapors were detected until the drilling reached depths of approximately 450-490 feet below the ground surface immediately above the fuel/groundwater. CABQ has tested air quality near Bullhead Park and the results were normal.

Q. Does Kirtland AFB test the water for biogenic gases or for indicators of ongoing bioremediation?

A. Kirtland AFB's ongoing soil vapor sampling program does analyze for gases, such as carbon dioxide, that indicate the presence of ongoing biological activity that is bioremediating the fuel in the subsurface. These analyses do indicate that biological degradation of the fuel is ongoing at the site. The sampling program that will be undertaken following installation of the additional scheduled monitoring points will also include analyses for indicators of biological degradation.

Q. Has the contamination been reported to the regulatory agency? If yes, what is the regulatory agency requiring?

A. The discovery of the contamination was immediately reported verbally to the New Mexico Environment Department Groundwater Quality Bureau and further documented in required written

reports within the regulatory required timeframes. Kirtland AFB is in compliance with regulatory requirements. The regulatory agency requires the fuel to be investigated and remediated. There is no timeframe for removal at this point as the full extent of the contamination has not been determined. Kirtland AFB personnel are working as expeditiously as possible to remediate the situation as we continue to investigate the extent of the fuel contamination.

Q. What federal regulatory laws are applicable to this issue?

A. Kirtland AFB is required to be in compliance with the New Mexico Water Quality Act and the associated Water Quality Control Commission regulations.

Q. What point would this be classified as a superfund cleanup site?

A. The site is currently regulated under the New Mexico Environment Department's Ground Water Bureau jurisdiction as opposed to federal EPA regulation. The site is not expected to enter the EPA's Comprehensive Environmental Response, Compensation, and Liability Act, or Superfund, program.